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Designing and determining psychometric characteristics of satisfaction measurement questionnaire of the parents' infants, hospitalized in Neonatal Intensive Care Unit

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ABSTRACT

Aims: Patient's satisfaction has been attended as an important criterion for studying performed cares in recent decade. Achieving such aims should be based on using a valid tool and aboriginal culture. So this study had been done with the aim of designing and measuring validity and reliability of the tools for measuring parents' satisfaction that have a hospitalized infant in Neonatal Intensive Care Unit (NICU) about hospital services.

Methods: In this methodological study, firstly initial tools have been designed with 60 items according to literature review. Then content and face validity had been provided through quantitative and qualitative study (CVI and CVR) and construct validity had been done in this way that by doing exploratory factor analysis, 300 parents with hospitalized patients had been chosen during cluster sampling from chosen state hospitals of Tehran in 2013. Reliability had been assessed through internal consistency.

Results: Final questionnaire had been approved with 49 items in three areas of welfare services, nursing cares and medical cares. In the results of exploratory factor analysis, KMO sampling index was 0.945. Also Bartlett test of Sphericity with 12593.822 in the level of 0.0001 was significant. Reliability has been approved by α=0.96.

Conclusions: Considering that all validity and reliability indexes of the questionnaire are reported in an appropriate level, infants' parents' satisfaction questionnaire can be used as a valid and reliable questionnaire in measuring infants' parents' satisfaction, hospitalized in NICU.

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1. Introduction

The main motivation of all the efforts and changes of the human society is the human's promotion and providing health. Achieving this aim is possible only through providing appropriate and necessary services. Desirability level of the provided services needs is establishing an evaluation system, in that system; patients' point of view should be

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attended as the main client of the services [1]. Patients are a very good source for collecting information and evaluating cares and services quality, and attending their point of view during planning and evaluating services is their right and it should be attended. Also national development and promotion of people's life, without paying attention to the quality of providing health and treatment services are not going to be possible [2].

In modern management system, studying patients' satisfaction has been attended more and is counted as an important index of health care quality and so one of the very important activities of every system is measuring patient's satisfaction [3]. The importance of paying attention to the level of patients' satisfaction of treatment-health services has an important role in management planning [4]. Patients' satisfaction is among the considered items in medical cares. Start of paying attention to that refers to 1950s. At that time, some sociologists like Szas and Parsons did some researches regarding relationship between doctor and patient [5].

Evaluating the present condition and patients' expectations level is importable part of improving quality of providing services and there are several benefits for that, which include: A) better relationship of therapist and patient, B) providing better information for improving health and treatment programs, C) Providing direct feedback from patients about daily activities of the staff, D) increase of referring to the systems that provide health and treatment services and improvement of financial function of these systems or an index and developing rehabilitation treatment programs and the best treatment methods [6].

Infant's Mortality Rate (IMR) lower than one year is one of the indexes that show health level in the society [7]. Nowadays, the most common death group of the kids in our country is in the age group of the infants [8], so infants as the vulnerable group of the society need more attention.

NICU is a place for providing progressed supportive cares, in which specialized equipment and trained and qualified people regarding infants' cares are used [9].

Considering the neonatal period, parents support the infant in health care's system, so they are representatives of the patients' views [10]. There are many factors that have role in providing parents' satisfaction in this part and measuring their satisfaction causes understanding of these factors [11].

There have been many studies for determining these factors. The results of the study of Fumis (2008) about parents' satisfaction regarding medical cares showed that friendly and honest relationship has the most percentage of parents' satisfaction [2]. Weiss et al. in 2010 showed that informing and giving awareness about treatment and cares after discharge and paying attention to parents' needs for what they want increase their satisfaction of hospital services [12, 13].

Since nurses are the most care providers in the hospitals, so there is emphasis on nursing services quality as one of the determining factors of patients' satisfaction [13]. Researches of Dierssen in 2009 showed that factors, such as; appropriate relationship with patient and his/her family and behaving gently and respectfully cause parents' satisfaction increase [14].

It has been emphasized on the importance of welfare services and care units in many studies. In these studies, things that were important from parents' view included: physical environment, security and convenience of the hospital, clarity, appropriate space, appropriate food and physically comfort [15].

Among famous scales of measuring parents' satisfaction, it can be pointed to Neonatal Index of Parent's Satisfaction (NIPS) by Belkington in 1995 that assessed parents' satisfaction of provided medical cares in NICU, by a checklist consist of 30 questions [16].

Following that in 1999 Kaner et al. made a Parent's Satisfaction Form (PSF) in NICU. This questionnaire includes 51 questions that

measure two aspects (medical and nursing cares) [17].

Another sample of the famous questionnaires, which can be pointed is Pediatric Family Satisfaction Questionnaire (PFSQ) [18]. In the study, which had been done by Pourmovahed et al. (2004), PFSQ was translated to Persian it was used [19]. But so far there hasn't been any valid questionnaire for measuring parents' satisfaction of the infants, hospitalized in NICU.

2. Methods

This study was a methodological study, which has been done.

First phase: for providing item, different sources such as, several articles about the subjects of the study and similar questionnaires in English such as; NIPS, PSF, PSFQ and the translated version of PFSQ to Persian had been studied. Items were made by considering linguistic and cultural aspect of the country.

The second phase: studying face validity, content and construct validity had been done as following:

In order to study face validity tow quantitative and qualitative methods had been used:

1. Qualitative method: in this stage, ten parents of the infants hospitalized in NICU stated their views about the appearance and suitability of the tools for evaluating considered aims.
2. Determining face validity with quantitative method (determining the item effect): after correcting items based on parents' view, in the next stage for decreasing and omitting inappropriate phrases, quantitative method of item effect had been used [20]. The work was like this that for every one of the questionnaire items, 5-part Likert range had been considered in the form of "very important to not important". Then it had been asked from those ten parents to answer the questions according to their experiences during infant's hospitalization [21]. Questions that the score of their effect size was less than 2 were omitted from the questionnaire.

Also for determining content validity, two qualitative and quantitative methods had been used.

1. Determining content validity through qualitative form: experts and specialists' views had been used regarding observing grammar, using appropriate words, putting items in its appropriate place and appropriate scoring [22].
2. Determining content validity through quantitative method: for studying content validity in quantitative form, two indexes of Content Validity Range (CVR) and Content Validity Index (CVI) had been calculated [22].

Content Validity Ratio calculation (CVR):

in this study, it has been asked from the experts group to study every item based on a three-part range of; necessary, useful, but not necessary, and it is not necessary [23]. Considering that there were 10 respondents, the minimum of accepted CVR was 0.62.

Content Validity Index calculation (CVI):

regarding this, three criteria of simplicity, specificity and clarity had been considered in a 4-part Likert range for every item [24]. Then, it had been asked from ten experts to provide the necessary feedback after quality and quantity study of the tools based on the following criteria.

Determining construct validity

After studying internal consistency of the questionnaire phrases, exploratory factor analysis method, which studies internal relationship among variables, had been used for class discovery of the variables that had the most relationship with each other [25]. In the analysis, factors of the items that had factor load of more than 0.3 had been used. Sample size was 300 people.

For analyzing data at the first of factor analysis, Kaiser-Meyer-Olkin Sampling Index had been done [26].

KMO sampling index amount in this factor analysis model was 0.945. Also Bartlett test of Sphericity with the amount of 12593.822 in the level of 0.0001 was significant. So it can be concluded that performing factor analysis base on Matris, achieved correlation in the sample of the study is justifiable. In this study, Varimax Rotation had been used for simplification and interpretation of the factor constructs of satisfaction survey questionnaire of the premature infants' parents.

In this study for determining reliability of the questionnaire, internal consistency calculation had been done with Chronbach's alpha coefficient [26]. In the study of correlation between different areas of the questionnaire with the entire questionnaire, Pearson correlation coefficient calculation method had been used.

After achieving necessary permissions from Baqiyatallah Medical Sciences University and getting written satisfaction from the units of the study, the aims of the study had been explained to the units of the study. Freedom of the units of the study for entrance and exit, and ensuring units of the study of confidentiality of their information and also explanation about the questionnaire being anonymous had been done.

3. Results

In the end of the first phase, the initial questionnaire had been prepared with 60 items. Then items had been classified based on their contents to three areas of welfare services, nursing cares and medical cares. There was a questionnaire including demographic features consists of questions such as; age, gender, education level, job, income amount, kind of insurance, number of the children, child rate, residence, reception shift, hospitalization experience and hospitalization period were at the beginning of the questionnaire.

In studying face validity, five items were omitted and the questionnaire had been decreased to 55 items. After CVR calculation of all the phrases, two phrases were omitted and the questionnaire had been decreased to 53 questions. After CVI calculation, the number of the items had been decreased to 49 items. In studying construct validity for determining the number of factors that make the questionnaire in exploratory factor analysis, screen plot method and Eigen value had been used. Screen plot showed that questions are included in three areas (figure 1) and three factors are enough for explaining the factor construct of satisfaction survey questionnaire of the premature infants' parents after studying internal consistency of the tools phrases. In this stage after calculating correlation matrix between variables, factors were extracted. Variables that had high

Table 1: Mean (Standard deviation) in every area

Area	Mean (Standard deviation)	The least	The most
Welfare services satisfaction	42.03(9.02)	13	65
Nursing services satisfaction	63.6 (14.5)	19	95
Medical services satisfaction	54.05 (11.9)	16	80
All the areas satisfaction	163.04(31.5)	49	243

Table 2: correlation between satisfactions of the areas

Area	Medical cares	Nursing cares	Welfare services
Welfare services	-	-	-
Nursing cares	-	-	r=0.5, p=0.0001
Medical cares	-	r=0.8, p=0.0001	r=0.5, p=0.0001
Total	r=0.9, p=0.0001	r=0.9, p=0.0001	r=0.7, p=0.0001

correlation with each other were in a category or factor. Three main factors including; hospital services and equipment, nursing cares, medical cares consisted of satisfaction survey of premature infants' parents. The first factor, which had been named Hospital services and equipment, included 13 questions. The second factor, which had been named Nursing cares, included 19 questions and the third factor, which had been named medical cares included; 16 questions.

In reliability calculation, the achieved Chronbach's alpha for the area of welfare services is 0.86, nursing cares 0.95, Medical care's 0.94, and for the entire questionnaire, it is 0.96.

10 experts with Nursing PHD specialization orientation (6 persons), MA in nursing (2 persons), pediatricians (2 persons), cooperated in quantitative and qualitative study of tools.

Parents participating in this study were 275 female and 25 male. Mean and standard deviation of parents' age, participating in the study was 29.38±5.92 years old and 50.7% frequency was related to the group age of 28-37 years old.

Most of the parents had one child (53.7%), education higher than diploma (41%), housewife (73%) and without income (72.3%) and regarding residency location 77.7% lived in Tehran and 23.3% lived in other cities. Mean and standard deviation of the achieved score had been calculated among the samples of the study for the areas of welfare services, nursing cares, medical cares and the total of the questionnaire (Table 1).

Also results showed that; there was correlation between achieved scores of the questionnaire with the total score, also there was significant correlation between the level of satisfaction from all the areas with each other (p=0.0001) (table 2).

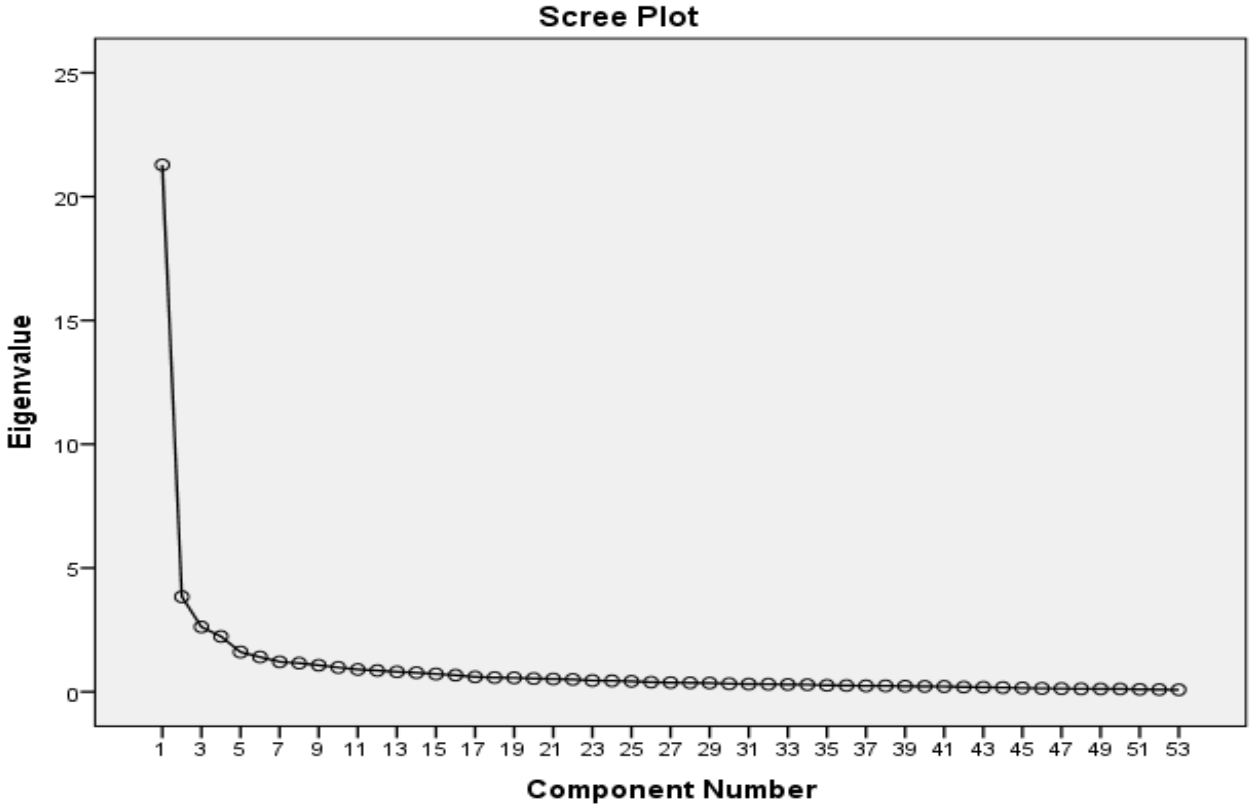

Figure 1: Screen plot for determining number of the factors that made the questionnaire

4. Discussion

Patients' satisfaction means their attitudes towards the amount of providing expectations and preferences of holistic done cares in Medical centers [27], considering this, among the main disadvantages of NIPS checklist, which had been designed by Blacking ton does not care about nursing cares and hospital welfare services [16]. Since the major part of parents' satisfaction is depended on the provided services in nursing and welfare part of the hospital, so this checklist is not able to measure parents' satisfaction level exactly.

Conner et al. questionnaire (1999) includes 51 questions that measure two areas (nursing, medical cares) [17]. This questionnaire has less care about welfare services, which can be a weak point for this questionnaire. On the other side, many questions of this questionnaire are not in consistent with our country culturally and aboriginality.

Based on the survey of the done texts, it seems that there hasn't been any Iranian tool designed for measuring parents' satisfaction in NICU, and the used questionnaires in the similar studies have been performed by using translated version of the foreign tools or they were developed by the researcher or based on the aims of the study. Common and almost current characteristic of the used tools in the both recent cases is the lack of providing enough information about the quality of the research tools validity.

Such characteristic can make challenge for publishing results of the study, and in the case of publication, it is possible that the reader does not achieve necessary awareness and assurance of the quality of the tools validity and the way of its evaluation.

So by considering the importance of measuring satisfaction of infants' parents, hospitalized in NICU and need to a valid tool for measuring this content, made us to do a sectional study about standardization of the questionnaire of parents' satisfaction of the infants, hospitalized in NICU. After initial study of this questionnaire, it led to calculation of three areas of effective factors on parents' satisfaction (welfare services satisfaction, nursing cares and medical cares) [28-30].

These three areas based on effective factors on parents' satisfaction was an exclusion of the texts review and by considering construct validity approve of the questionnaire through high indexes such as; content validity index, Keisen Mayer index and the percentage of cumulative variance of over exploratory factor analysis and also very high reliability index approve with 0.96 Chronbach's-alpha, there is no doubt about validity of these tools. So based on the findings and benefits of these tools such as its appropriate areas, special design of that for measuring parents' satisfaction of the infant hospitalized in NICU, its high validity and reliability, using this tool can be suggested as an appropriate tool.

In the present study, it has been tried, simultaneously with designing valid tools for evaluating parents' satisfaction in NICU through explaining enough information about the evaluation process of tools validity and reliability, reader achieves awareness and assurance about the situation of quality of the designed tools validity and the way of its evaluation. For the first time in the country, designing this tool has been done, based on psychometric process and by using aim group views and remarkable and various number of the specialists. Paying attention to maintaining simplicity and eloquence and observing brevity and logical sequence of the items are counted as the positive points of this tool. However inaccessibility to the similar studies in national level can be counted as the limitations of the study.

5. Conclusions

Considering that indexes of questionnaire reliability and validity are all reported in an appropriate level, questionnaire of premature infants' parents' satisfaction can be used as a valid and reliable questionnaire in measuring parents' satisfaction in NICU.

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